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$$\begin{aligned}
u_2 &= \frac{a^2x - x^3}{c} (e^{cx} + e^{-cx}) \Big|_0^a - \frac{1}{c} \int_0^a (a^2 - 3x^2)(e^{cx} + e^{-cx}) dx \\
&= -\frac{1}{c^2} \left[(a^2 - 3x^2)(e^{cx} - e^{-cx}) \Big|_0^a + 6 \int_0^a x(e^{cx} - e^{-cx}) dx \right] \\
&= -\frac{1}{c^2} \left[-2a^2(e^{ac} - e^{-ac}) + \frac{6}{c} \left\{ a(e^{ac} + e^{-ac}) - \frac{1}{c}(e^{ac} - e^{-ac}) \right\} \right] \\
&= \frac{1}{c^2} \left[2a^2(e^{ac} - e^{-ac}) - \frac{6a}{c}(e^{ac} + e^{-ac}) + \frac{6}{c^2}(e^{ac} - e^{-ac}) \right].
\end{aligned}$$

Substituting the values of u_1 and u_2 in the expression above for u we obtain the desired result.

NOTES AND NEWS.

EDITED BY W. DEW. CAIRNS.

"The propagation of electric waves in wireless telegraphy" is the title of a paper by Professor George R. Dean, of the Missouri School of Mines, in *The Electrician* for September 11, 1914.

Dr. L. L. DINES, formerly professor of mathematics at the University of Arizona, has been elected to an associate professorship at the University of Saskatchewan.

The Southwestern Section of the American Mathematical Society held its eighth regular meeting at the University of Nebraska on Saturday, November 28, 1914.

Mr. J. L. RILEY, formerly instructor in mathematics at the University of Oklahoma, has accepted a fellowship in Rice Institute, Houston, Texas, for the year 1914-15. Professor E. P. R. DUVAL has returned to his former position as associate professor of mathematics at the University of Oklahoma.

Dr. E. E. Whitford has been promoted to an assistant professorship of mathematics at the College of the City of New York.

Mr. Joel D. Eshleman, A.B., has been appointed instructor in mathematics in Adelbert College, Western Reserve University.

Dr. E. B. Stouffer, formerly instructor in mathematics in the University of Illinois, has accepted an assistant professorship in the University of Kansas.

Professor M. Frechet, University of Poitiers, France, who was to lecture at the University of Illinois during the present year, has joined the French army.

The Cambridge University Press of England has published "Tables for Statisticians and Biometricians" by Karl Pearson in quarto form, 228 pages.

The University of Chicago Press announces as in press "The Theory of Collineation Groups" by Professor H. F. Blichfeldt, of Leland Stanford Junior University.

A second revised edition of the English translation by Dr. G. G. Morrice of Professor Felix Klein's well-known "Lectures on the Icosahedron and the Solution of Equations of the Fifth Degree" has just been issued from the press of Kegan Paul, Paris; Trubner and Co., London.

The majority of the American reports to the International Commission on the Teaching of Mathematics are no longer given free distribution by the U. S. Bureau of Education; it is therefore necessary to correct the statement made at the end of the September MONTHLY. On application, however, to the Commissioner of Education, Washington, D. C., a bulletin of the publications of the Bureau will be sent free, giving the prices at which these may be obtained. The whole set of reports above mentioned costs less than one dollar.

At the University of Chicago the departments of mathematics and mathematical astronomy combine as one body, on the one hand in the biweekly club meeting for reports of research in progress, and on the other hand in certain stated meetings for social intercourse. Under the latter head, a general dinner is held in the autumn for the advanced students and members of the staff, a dinner in the spring for the fellows of the departments provided by the members of the staff, and a general dinner in the summer for advanced students and staff. The members of the staff also meet regularly each month for a dinner and evening discussion of matters pertaining to the departments. The autumn general dinner was held on Wednesday evening, October 14, 1914, with an attendance of about fifty.

In recent numbers of *Comptes Rendus* of the French Academy of Science appear the following preliminary notes: May 25, Professor T. H. Gronwall on "The series of Laplace"; June 8, Professor T. H. Gronwall on "Some methods of summation and their application to Fourier's series"; June 15, Professor C. N. Moore on "The relation between certain methods for the summation of a divergent series." The last two are independent announcements to the effect that the method of de La Vallée-Poussin is more general than that of Cesàro.

Among recent publications of interest to teachers of mathematics is "The Teaching of Mathematics" by Professor R. E. Manchester, of the State Normal School, Oshkosh, Wisconsin. This text of 75 pages, published by C. W. Bardeen, Syracuse, after treating the practical benefits of the study of mathematics and the leading considerations in the teaching of arithmetic, algebra, and geometry, deals with the place of mathematics in vocational schools and with methods and modes of presenting these subjects.

The Central Association of Science and Mathematics Teachers met in the Hyde Park High School, Chicago, November 27 and 28. According to the program as issued by the secretary, Mr. W. L. Eikenberry, University High School, University of Chicago, the subject of last year "Vocational courses in science and mathematics" was continued as a part of this year's subject for discussion, viz., "Problems arising in adjusting applied science to high school curricula." A full report of report of the meetings of the Mathematics Section will be made in a later issue.

The Macmillan Co. has recently published "The theory of relativity," a book of 295 pages by L. Silberstein, lecturer in natural philosophy at the University of Rome. It is based, in part, upon a course of lectures delivered in University College, London, in 1912-13.

The British Board of Education has issued a "Memorandum on the Teaching of Geometry in Secondary Schools" which covers essentially the same ground as the circular on geometry issued five years ago by the Board and now out of print.

A large volume entitled "List of Prime Numbers from 1 to 10,006,721" by Professor D. N. Lehmer, University of California, was recently published by the Carnegie Institution of Washington. The last four digits of the primes are given in the body of the table and the remaining digits are at the top and bottom of the columns. Five thousand primes are listed on each page, and the table gives the rank of any prime in the series of primes. The same precautions were taken in printing these tables as were observed in printing the factor tables for the first ten million numbers, which were prepared in 1909 by the same author under the auspices of the Carnegie Institution. By the publication of these tables Professor Lehmer has rendered an important service to mathematics, in view of their great accuracy and convenient arrangement.

The last volume (XXI) of the *Proceedings* of the Society for the Promotion of Engineering Education contains, among numerous articles of a more special nature, three which have a general interest and which perhaps deserve mention here. The titles are

- (1) How Can the Colleges and the Industries Cooperate?
By Ivy L. Lee, Executive Assistant, Penn. R. R. Co.
- (2) [Same title as (1)].
By Edward D. Sabine, Terminal Engineer, N. Y. C. & H. R. R.
- (3) Recommendations Concerning the Units of Force.
By Professor E. V. Huntington, Harvard University.

The first two will be interesting and instructive to upper classmen in schools of engineering. The third is especially recommended to teachers of physics in secondary schools.

The universities of Great Britain, according to announcements, opened as usual this academic year with probably half the regular attendance, one half being in active military service. The German universities also are reported to have opened.

Professor F. R. Moulton published in *Popular Astronomy* for August–September a very lucid and comprehensive analysis of the works of the noted American astronomer, Dr. George W. Hill, who died April 16, 1914.

“*Problemi della Scienza*,” published in 1906 by F. Enriques, professor of projective and descriptive geometry in the University of Bologna, has been translated into English by Katharine Royce; the book is published by the Open Court Publishing Company under the title “*Problems of Science*.”

A press dispatch appeared in August describing the unusual mental calculations carried out before a class in psychology at the summer session of the University of California by Arthur A. Gamble, “a 21-year-old student of the University of Chicago.” A letter of inquiry to Professor Warner Brown of the department of psychology in the University of California brought an authoritative account from which the following interesting extracts are taken.

“He is not a college student.¹ . . . He knows no mathematics beyond simple arithmetic—does not even know what logarithms are or how they are used. He does know several short-cuts in multiplication and division (multiplying from the left, etc.). His *forte* is factoring. He can give offhand (5 seconds or less) two numbers which when multiplied together make any 5- or 6-place number which is proposed; he often gives two numbers which nearly make the given number, with a statement of the remainder. As you see, this depends upon the knowledge of a rather extended multiplication table, say up to 500. He is familiar enough with the products of numbers to be able to give squares and cubes quickly. . . .

“Division he accomplishes by tentative multiplication, which is easier for him. Cube roots are not easy for him; he makes a large number of guesses and tries them out by multiplication. . . . He knows the powers of 2 (“doubling a penny”) up to the 32d and can reel them off as fast as he can speak.²

“He knows the data necessary for calendar computations and gives the day of the week for any date very quickly.

“He *cannot* add very rapidly.³ His memory for *digits* is not unusual, but he can hold in memory a large collection of *numbers*. . . . He has an unbounded

¹ He visited the University of Chicago and members of the mathematical staff tried him out with the same conclusions as reached by Professor Brown. They advised him to return to his home in Rochester, N. Y., and continue his regular high school course rather than continue to develop his freakish propensities. EDITORS.

² Evidently memorized from the famous horse shoe problem. Ed.

³ The newspaper item stated that Dr. Brown handed simultaneously to Mr. Gamble and an expert adding machine operator a list of numbers to be added, all of four or more digits, Mr. Gamble obtaining the correct sum more quickly than the mechanical adder. Ed.

interest in numbers as numbers. The result is that he has come to individualize thousands of them to almost the same extent that you or I individualize the numbers below 100; he knows their relationships in the arithmetical family."

L'Enseignement Mathématique is doubtless the leading journal devoted to the pedagogy of mathematics. This appears under the joint editorship of C. A. Laisant of Paris and H. Fehr of Geneva, with the collaboration of A. Buhl of Toulouse; it is published by Gauthier-Villars of Paris and Georg and Cie of Geneva. The publication is now in the sixteenth year; the subscription price is 15 francs per year (Stechert and Co., West 25th St., New York City). Each volume consists of about 500 pages.

Probably the general nature of the journal is best illustrated by a summary of the articles which appear in the current volume (1914). The first number, issued January 15, 1914, of some 80 pages, includes articles on non-Euclidean geometry as applied to the theory of relativity, on multiple equalities, on the integration of the equations for the movements of a planet about the sun, on some points on the theory of sets, on transcendental plane curves given by equations in which the variables are separable, on a double system of lines on a surface, on an application of the rule of false position, and on new formulas for Heronian triangles. These articles by French, German, Italian, and Russian authors are all written in French. In addition to the articles, space is devoted to current events, to notes and documents, to reviews, and bibliography. The second number is of the same general nature as the first, while the third, fourth, and fifth issues are devoted almost entirely to a report of the International Conference on the teaching of mathematics which was held at Paris, April 1-4, 1914.

The titles of the articles, above-mentioned, show clearly that the appeal is made not to the beginner in mathematics but to the real student of the science. Historical articles are of rather infrequent occurrence. The notes and documents in recent issues have been devoted in large measure to the activities of the International Commission, while the treatment of reviews and bibliography of current literature in the field does not vary greatly from the procedure in American journals.

ERRATA.

Page 164, line 4 up. For J. A. Colson, *read* J. W. Clawson. Page 190, under Algebra. For **416** *read* **416A**, and for **417** *read* **417A**. Page 258, line 8 up. For 2^{2a_3} *read* 2^{2a_3} . Page 259, line 2 down. For $\chi^{p(p-1)}$ *read* $x^{p(p-1)}$. Page 290, line 2 up. For dr^{n-1} *read* $d^{n-1}r$.

Also on page 259, the author wishes to substitute for the paragraph (4) the following: "To point out that although the *Conchoid of Nicomedes* is used in the text to trisect an angle, this application of the curve was a discovery claimed by Pappus (about 300 A. D.).¹ Nicomedes (about 180 B. C.) used the curve for the duplication of the cube² and we have only the assertion of Proclus that Nicomedes also used it for the trisection of an angle."

Page 299, last line, last term. For $(-1)^k$ *read* $(-1)^{k-1}$.